

Exploring the World of Math

Name: _____ Date: _____

Sharing

1. Four people named Pamela, Ryan, Sharon and Paul will divide a cake that is divided into four slices, s1, s2, s3 and s4. The table gives us the value of each slice in the eyes of the individuals.

	S1	S2	S3	S4
Pamela	\$2.50	\$4.00	\$4.00	\$1.75
Ryan	\$3.25	\$3.25	\$3.25	\$3.25
Sharon	\$2.75	\$2.50	\$2.25	\$2.25
Paul	\$2.75	\$2.40	\$2.45	\$2.45

- a. What items are fair shares to Pamela?
 - b. What items are fair shares to Ryan?
 - c. What items are fair shares to Sharon?
 - d. What items are fair shares to Paul?
 - e. What is the only fair division of the cake?
2. China, US and Russia are bidding on three items labeled s1, s2 and s3. They all want to win one item and leave for home. Their bids are:

	S1	S2	S3
China	\$34 billion	\$25 billion	\$20 billion
USA	\$20 billion	\$20 billion	\$20 billion
Russia	\$20 billion	\$22 billion	\$25 billion

- a. What items are fair shares to China?
- b. What items are fair shares to the USA?
- c. What items are fair shares to Russia?
- d. What is the only fair division of s1, s2 and s3?

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3. Explain the Divider Chooser method where there is a sub that is $\frac{1}{2}$ vegetarian and $\frac{1}{2}$ meatlovers. Sam likes the meatlovers side 3 times better than the vegetarian and he is the divider. Stacey like vegetarian and hates meat and she is the chooser.
 - a. Sam should cut the sub in what manner?
 - b. Stacey would choose the sub in what manner?
4. Ben likes chocolate cake 5 times more than yellow cake. We have a single cake, one half chocolate and one half yellow. The cake is \$25.
 - a. How much is $\frac{1}{2}$ of the yellow cake worth to Ben?
 - b. How much is the chocolate cake worth to Ben?
 - c. How much is $\frac{1}{3}$ of the chocolate cake worth to Ben?
 - d. How much is $\frac{1}{4}$ of the yellow cake worth to Ben?